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(54) **METHOD AND SYSTEM FOR  
AUTOMATICALLY PAUSING  
ADVERTISEMENTS BASED ON USER  
ATTENTION**

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CPC ..... **G06Q 30/0272** (2013.01)

(58) **Field of Classification Search**  
None  
See application file for complete search history.

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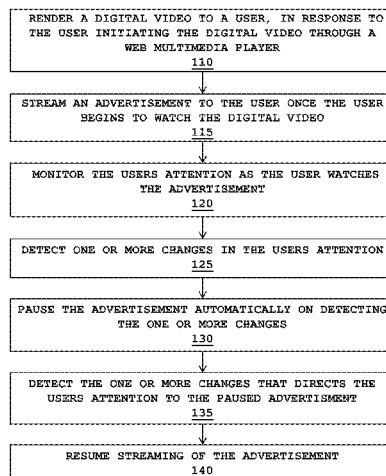
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(57) **ABSTRACT**

A computer-implemented method for automatically pausing advertisements based on user attention includes rendering a digital video to a user, in response to the user initiating the digital video through a web multimedia player. The computer-implemented method also includes streaming an advertisement to the user once the user begins to watch the digital video and monitoring the user attention as the user watches the advertisement. The user attention is monitored based on keystrokes and mouse movements. Further, the computer-implemented method includes detecting one or more changes in the user attention. Furthermore, the computer-implemented method includes pausing the advertisement automatically at instance of detecting the one or more changes. Moreover, the computer-implemented method includes detecting the one or more changes that directs the user attention to the paused advertisement and resuming streaming of the advertisement.

**20 Claims, 6 Drawing Sheets**



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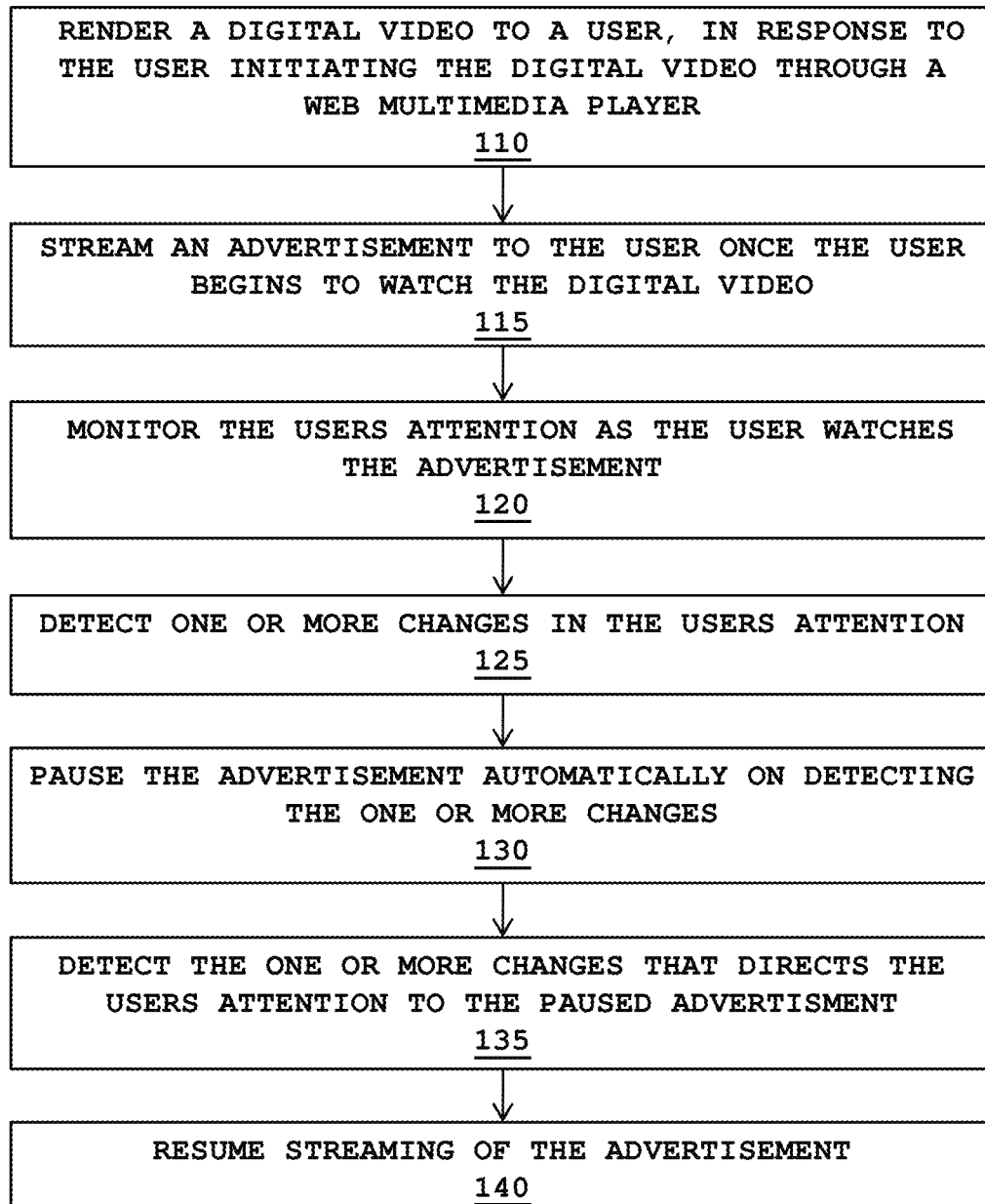


FIG. 1



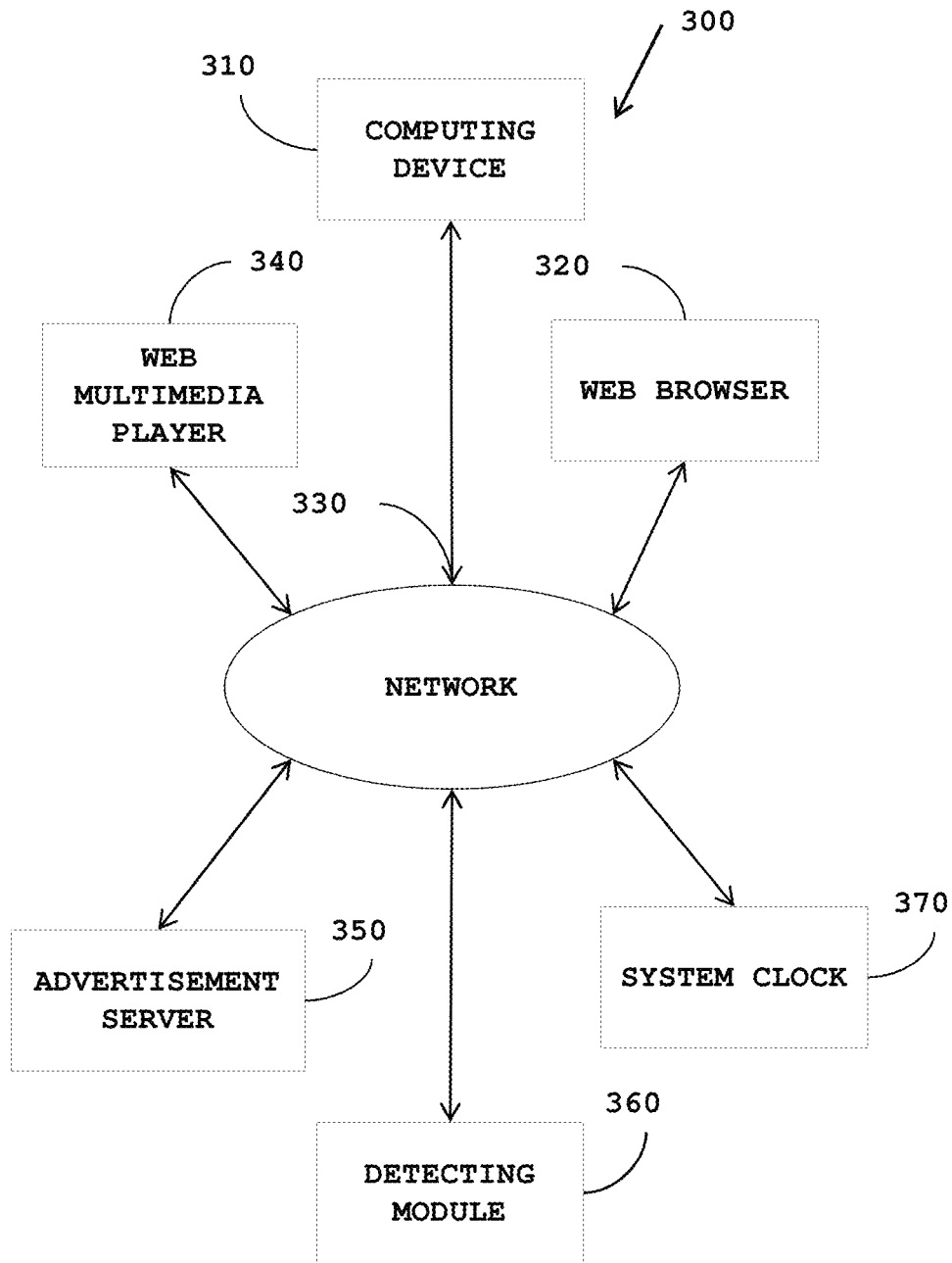
FIG. 2a

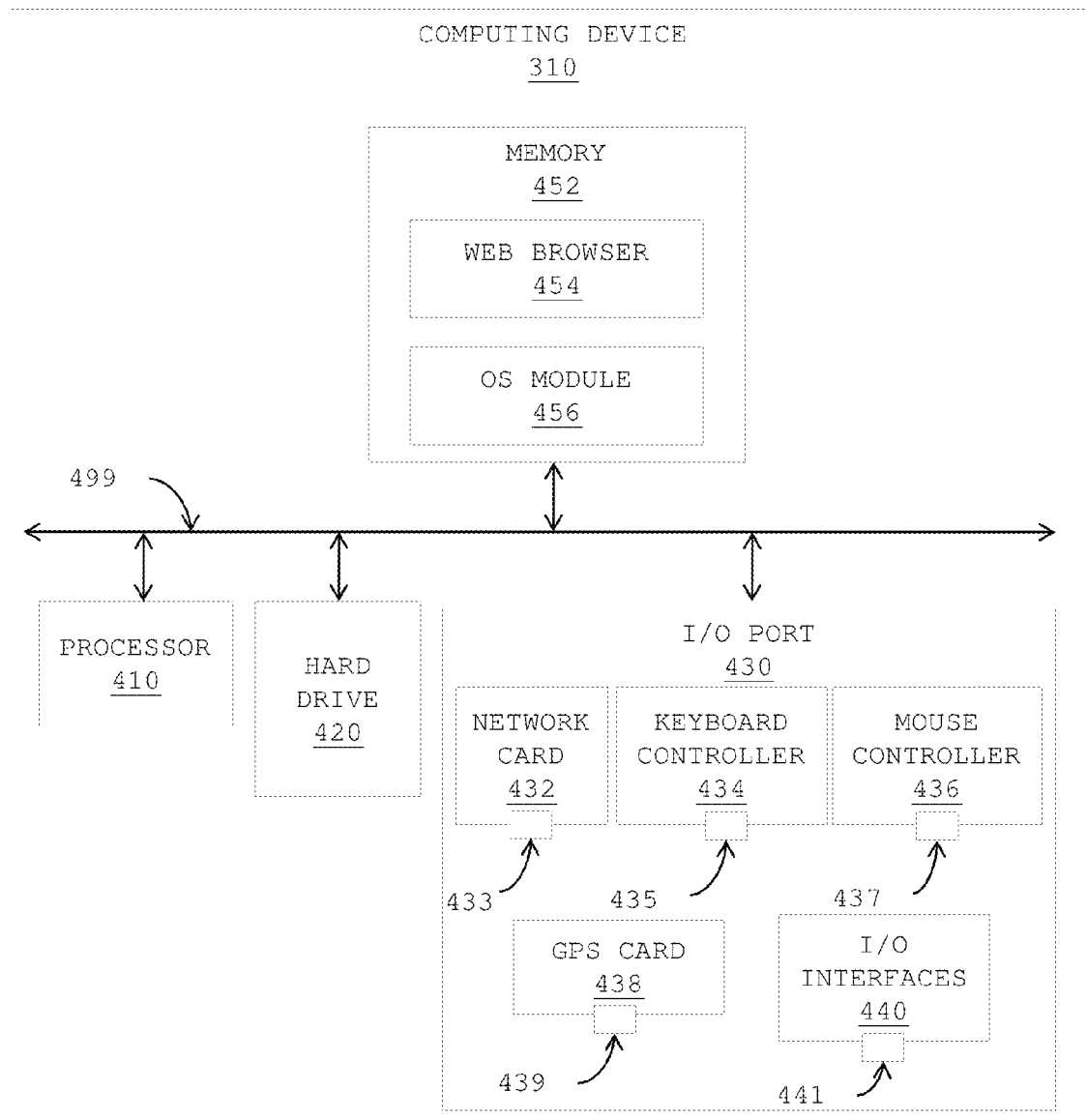


FIG. 2b



FIG. 2c

**FIG. 3**

**FIG. 4**



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# METHOD AND SYSTEM FOR AUTOMATICALLY PAUSING ADVERTISEMENTS BASED ON USER ATTENTION

## TECHNICAL FIELD

Embodiments of the disclosure relate generally, to browser based applications and more specifically, to automatically pause advertisements based on user attention.

## BACKGROUND

Browsing activities continue to widespread among thousands of users who cultivate the web as an essential tool to access information and web applications. Web applications are accessed by users over a network such as Internet or Intranet. Common web applications include webmail, multimedia content, online retail sales, online auctions, wikis and many such kinds.

In scenarios where the users accesses multimedia content for example, web videos, appropriate videos are rendered to the users. Occasionally, advertisements are also rendered to the users. In such circumstances, a normal tendency of the users while watching advertisements is to divert ones attention towards other web applications. Additionally, other possibilities arise when the users get up and engage themselves in other activities such as cooking, door bells and phone calls. Consequently, the user may leave a current web page where the advertisements are played. As a result, the user may miss the advertisements being played. The user will need to replay the advertisement once again from the beginning. This process is time consuming as the user would have previously watched a specific part of the advertisement and becomes unexciting. Moreover, the process becomes cumbersome.

In light of the foregoing discussion, there is a need for an efficient method and system for automatically pausing advertisements based on user attention.

## SUMMARY

The above-mentioned needs are met by a computer-implemented method, computer program product, and system for automatically pausing advertisements based on user attention.

An example of a computer-implemented method for automatically pausing advertisements based on user attention includes rendering a digital video to a user, in response to the user initiating the digital video through a web multimedia player. The computer-implemented method also includes streaming an advertisement to the user once the user begins to watch the digital video and monitoring the user attention as the user watches the advertisement. The user attention is monitored based on keystrokes and mouse movements. Further, the computer-implemented method includes detecting one or more changes in the user attention. Furthermore, the computer-implemented method includes pausing the advertisement automatically at instance of detecting the one or more changes. Moreover, the computer-implemented method includes detecting the one or more changes that directs the user attention to the paused advertisement and resuming streaming of the advertisement.

An example of a computer program product stored on a non-transitory computer-readable medium that when executed by a processor, performs a method for automatically pausing advertisements based on user attention includes rendering a digital video to a user, in response to the user initiating the digital video through a web multimedia player. The computer program product includes streaming an advertisement to the user once the user begins to watch the digital video and monitoring the user attention as the user watches the advertisement. Further, the computer program product also includes detecting one or more changes in the attention of the user. Further, the computer program pausing the advertisement automatically at the point of detecting the one or more changes. Moreover, the computer program product includes detecting the one or more changes that directs the attention of the user to the paused advertisement and resuming streaming of the advertisement.

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An example of a system for automatically pausing advertisements based on user attention includes a computing device. The system also includes a web browser loads a plurality of web pages to the user. Further, the system includes a web multimedia player that renders a digital video to the user. Furthermore, the system includes an advertisement server that streams advertisements on the web pages. Moreover, the computer program product includes a detecting module to detect one or more changes in the attention of the user.

The features and advantages described in this summary and in the following detailed description are not all-inclusive, and particularly, many additional features and advantages will be apparent to one of ordinary skill in the relevant art in view of the drawings, specification, and claims hereof. Moreover, it should be noted that the language used in the specification has been principally selected for readability and instructional purposes, and may not have been selected to delineate or circumscribe the inventive subject matter, resort to the claims being necessary to determine such inventive subject matter.

## BRIEF DESCRIPTION OF THE FIGURES

In the following drawings like reference numbers are used to refer to like elements. Although the following figures depict various examples of the invention, the invention is not limited to the examples depicted in the figures.

FIG. 1 is a flow diagram illustrating a method for automatically pausing advertisements based on user attention, in accordance with one embodiment;

FIG. 2a, FIG. 2b and FIG. 2c are exemplary representations of the method, in accordance with one embodiment;

FIG. 3 is a block diagram illustrating a system for automatically pausing advertisements based on user attention, in accordance with one embodiment; and

FIG. 4 is a block diagram illustrating an exemplary computing device, in accordance with one embodiment.

## DETAILED DESCRIPTION OF THE EMBODIMENTS

A computer-implemented method, computer program product, and system for automatically pausing advertisements based on user attention are disclosed. The following detailed description is intended to provide example implementations to one of ordinary skill in the art, and is not intended to limit the invention to the explicit disclosure, as one of ordinary skill in the art will understand that variations can be substituted that are within the scope of the invention as described.

FIG. 1 is a flow diagram illustrating a method for automatically pausing advertisements based on user attention, in accordance with one embodiment.

At step **110**, a digital video is rendered to a user, in response to the user initiating the digital video through a web multimedia player.

Occasionally, the user wishes to access multimedia content such as a digital video on a web page. Consequently, the user enters an appropriate Uniform Resource Locator (URL) in a web browser. The web browser can be a desktop web browser (for example, Internet Explorer, Mozilla, or Chrome), a mobile browser, or a web viewer built into an application program. The webpage can include textual information, digital images, videos, video and static advertisements, and other digital assets. Further, the digital video is rendered through a web multimedia player, such as YouTube and Yahoo video.

The digital video is rendered to the user on a first browser tab.

At step **115**, an advertisement is streamed to the user once the user begins to watch the digital video.

Typically, advertisements are displayed while the user watches the digital video. The advertisements include multiple moving pictures and text related to a specific product, for example, cars, electronic gadgets, resorts and so on.

As the web page is loaded, the web browser gets connected to an advertisement server. The advertisement server generally stores advertisements that are to be delivered to the user.

At step **120**, the user attention is monitored based on keystrokes and mouse movements, as the user watches the advertisement.

A normal tendency of the user browsing the web is to keep changing attention between various applications and features found on the web page. In some scenarios, the user may want to open another application in an alternative browser tab. To be acquainted with the attention of the user is vital and consequently the attention of the user is monitored.

At step **125**, one or more changes are detected in the attention of the user.

The one or more changes results when the user switches attention due to a plurality of factors. The factors include attention to another application and attention to a second browser tab. In some embodiments, the changes can be detected by user movements such as mouse movements and keystrokes.

In the scenario when the user opens the second browser tab, a picture of the paused advertisement is captured. In some embodiments, the picture can be snapshot of the advertisement that was streamed.

Subsequently, the picture captured is displayed on the web page on the second browser tab. In one embodiment, the picture is displayed towards a corner of the web page. Consequently, the user is attentive about the advertisement played earlier.

At step **130**, the advertisement is paused automatically on detecting the one or more changes.

At the instance when the changes are detected, the advertisement played originally is automatically paused.

At step **135**, the one or more changes that directs the user attention to the paused advertisement is detected.

The changes are constantly detected. One of the changes directs the user attention to the advertisement that was initially played to the user.

At step **140**, the advertisement resumes to be streamed.

The paused advertisement continues to be streamed to the user. As a result, the user does not miss the advertisement when drifted attention.

FIG. **2a**, FIG. **2b** and FIG. **2c** are exemplary representations of the method, in accordance with one embodiment.

FIG. **2a** represents an exemplary representation of a user watching an advertisement **210** on a web page displayed on a first browser tab **215**.

Consider a scenario when a user desires to browse Internet and opens a web page on a first browser tab **215**. The web page includes text, images and the advertisement **210**. The advertisement **210** begins to play when the web page is loaded.

FIG. **2b** represents an exemplary representation of the user changing attention from the advertisement **210** and opening a different web page on a second browser tab **220**. The change in the attention of the user is detected and consequently the advertisement **210** is paused. Subsequently, the user gets engaged with other applications on the web page now displayed on the second browser tab **220**.

The advertisement **210** is captured and displayed on the web page displayed in the second browser tab **220**. In some embodiments, the advertisement **210** is displayed in a corner of the web page. As a result, the user is now conscious that the advertisement **210** has been paused and can continue playing the advertisement **210** if wished for.

FIG. **2c** is an exemplary representation of the user changing attention back to the first browser tab **210**. Consequently, the advertisement **210** resumes and is played to the user. Accordingly, the user does not miss on the advertisement **210** that was originally being played.

FIG. **3** is a block diagram illustrating a system for automatically pausing advertisements based on attention of the user, in accordance with one embodiment.

The system **300** can implement the method described above. The system **300** includes a computing device **310**, a web browser **320**, a web multimedia player **340**, an advertisement server **350**, a detecting module **360** and a system clock **370** in communication with a network **330** (for example, the Internet or a cellular network).

Examples of the computing device **310** include, but are not limited to, a Personal Computer (PC), a laptop or notebook computer, a tablet computer, a smart phone or Personal Digital Assistant (PDA), a smart appliance, an Internet television or any other suitable processor-based device that can display advertisements.

The computing device **310** includes a web browser **320**. The web browser can be a desktop web browser (for example, Internet Explorer, Mozilla, or Chrome), a mobile browser, or a web viewer built integrated into an application program.

The web browser **220** loads web pages desired by the user. The web pages can include textual information, digital images, video and static advertisements, and other digital assets.

The web multimedia player **340** renders digital videos and advertisements to the user of the computing device **310**. In some embodiments, the receiving module **240** can be a component of the computing device **210**.

The advertisement server **350** selects advertisements that are displayed on the web page. The selected advertisements are rendered to the user.

The detecting module **360** constantly monitors the attention of the user on the web page. Moreover, the changes in attention of the user are detected by the detecting module **360**.

The system clock **370** constantly tracks a current time of play during the rendering of advertisements and digital videos on the web page.

The user of the computing device **310** desires to view a digital video through the web browser **320**. A web page is correspondingly displayed to the user in a first browser tab. Digital videos are rendered to the user by the web multimedia player **340**. Consequently, an advertisement is also rendered to the user by the advertisement server **350**. The user views

the advertisement. However, the user changes attention towards another application by opening a second browser tab. At this point, the advertisement is paused and the time of pausing is tracked by the system clock 370. A picture of the advertisement paused is captured and displayed to the user on the web page in the second browser tab. Subsequent changes in the attention of the user are monitored and detected by the detecting module 360. As the change is detected such that the attention of the user is drawn back to the advertisement paused, the advertisement resumes to be streamed to the user. The system clock 370 facilitates to resume playing the advertisement from the time of pausing. Consequently, the user does not overlook on the advertisement when changing attention to another application.

Additional embodiments of the computing device 310 are described in detail in conjunction with FIG. 3.

FIG. 4 is a block diagram illustrating an exemplary computing device, for example the computing device 310 in accordance with one embodiment. The computing device 310 includes a processor 410, a hard drive 420, an I/O port 430, and a memory 452, coupled by a bus 499.

The bus 499 can be soldered to one or more motherboards. Examples of the processor 410 includes, but is not limited to, a general purpose processor, an application-specific integrated circuit (ASIC), an FPGA (Field Programmable Gate Array), a RISC (Reduced Instruction Set Controller) processor, or an integrated circuit. The processor 410 can be a single core or a multiple core processor. In one embodiment, the processor 410 is specially suited for processing demands of location-aware reminders (for example, custom micro-code, and instruction fetching, pipelining or cache sizes). The processor 410 can be disposed on silicon or any other suitable material. In operation, the processor 410 can receive and execute instructions and data stored in the memory 452 or the hard drive 420. The hard drive 420 can be a platter-based storage device, a flash drive, an external drive, a persistent memory device, or other types of memory.

The hard drive 420 provides persistent (long term) storage for instructions and data. The I/O port 430 is an input/output panel including a network card 432 with an interface 433 along with a keyboard controller 434, a mouse controller 436, a GPS card 338 and I/O interfaces 440. The network card 432 can be, for example, a wired networking card (for example, a USB card, or an IEEE 802.3 card), a wireless networking card (for example, an IEEE 802.11 card, or a Bluetooth card), and a cellular networking card (for example, a 3G card). The interface 433 is configured according to networking compatibility. For example, a wired networking card includes a physical port to plug in a cord, and a wireless networking card includes an antennae. The network card 432 provides access to a communication channel on a network. The keyboard controller 434 can be coupled to a physical port 435 (for example PS/2 or USB port) for connecting a keyboard. The keyboard can be a standard alphanumeric keyboard with 101 or 104 keys (including, but not limited to, alphabetic, numerical and punctuation keys, a space bar, modifier keys), a laptop or notebook keyboard, a thumb-sized keyboard, a virtual keyboard, or the like. The mouse controller 436 can also be coupled to a physical port 437 (for example, mouse or USB port). The GPS card 438 provides communication to GPS satellites operating in space to receive location data. An antenna 439 provides radio communications (or alternatively, a data port can receive location information from a peripheral device). The I/O interfaces 440 are web interfaces and are coupled to a physical port 441.

The memory 452 can be a RAM (Random Access Memory), a flash memory, a non-persistent memory device,

or other devices capable of storing program instructions being executed. The memory 452 comprises an Operating System (OS) module 456 along with a web browser 454. In other embodiments, the memory 452 comprises a calendar application that manages a plurality of appointments. The OS module 456 can be one of Microsoft Windows® family of operating systems (for example, Windows 95, 98, Me, Windows NT, Windows 2000, Windows XP, Windows XP x64 Edition, Windows Vista, Windows CE, Windows Mobile), Linux, HP-UX, UNIX, Sun OS, Solaris, Mac OS X, Alpha OS, AIX, IRIX32, or IRIX64.

The web browser 454 can be a desktop web browser (for example, Internet Explorer, Mozilla, or Chrome), a mobile browser, or a web viewer built integrated into an application program. In an embodiment, a user accesses a system on the World Wide Web (WWW) through a network such as the Internet. The web browser 454 is used to download the web pages or other content in various formats including HTML, XML, text, PDF, postscript, python and PHP and may be used to upload information to other parts of the system. The web browser may use URLs (Uniform Resource Locators) to identify resources on the web and HTTP (Hypertext Transfer Protocol) in transferring files to the web.

As described herein, computer software products can be written in any of various suitable programming languages, such as C, C++, C#, Pascal, Fortran, Perl, Matlab (from MathWorks), SAS, SPSS, JavaScript, AJAX, and Java. The computer software product can be an independent application with data input and data display modules. Alternatively, the computer software products can be classes that can be instantiated as distributed objects. The computer software products can also be component software, for example Java Beans (from Sun Microsystems) or Enterprise Java Beans (EJB from Sun Microsystems). Much functionality described herein can be implemented in computer software, computer hardware, or a combination.

Furthermore, a computer that is running the previously mentioned computer software can be connected to a network and can interface to other computers using the network. The network can be an intranet, internet, or the Internet, among others. The network can be a wired network (for example, using copper), telephone network, packet network, an optical network (for example, using optical fiber), or a wireless network, or a combination of such networks. For example, data and other information can be passed between the computer and components (or steps) of a system using a wireless network based on a protocol, for example Wi-Fi (IEEE standards 802.11, 802.11a, 802.11b, 802.11e, 802.11g, 802.11i, and 1802.11n). In one example, signals from the computer can be transferred, at least in part, wirelessly to components or other computers.

Advantageously, the method ensures that the user does not miss the digital video when the user changes attentions. Moreover, the method prevents the user from neglecting the advertisement.

It is to be understood that although various components are illustrated herein as separate entities, each illustrated component represents a collection of functionalities which can be implemented as software, hardware, firmware or any combination of these. Where a component is implemented as software, it can be implemented as a standalone program, but can also be implemented in other ways, for example as part of a larger program, as a plurality of separate programs, as a kernel loadable module, as one or more device drivers or as one or more statically or dynamically linked libraries.

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As will be understood by those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Likewise, the particular naming and division of the portions, modules, agents, managers, components, functions, procedures, actions, layers, features, attributes, methodologies and other aspects are not mandatory or significant, and the mechanisms that implement the invention or its features may have different names, divisions and/or formats.

Furthermore, as will be apparent to one of ordinary skill in the relevant art, the portions, modules, agents, managers, components, functions, procedures, actions, layers, features, attributes, methodologies and other aspects of the invention can be implemented as software, hardware, firmware or any combination of the three. Of course, wherever a component of the present invention is implemented as software, the component can be implemented as a script, as a standalone program, as part of a larger program, as a plurality of separate scripts and/or programs, as a statically or dynamically linked library, as a kernel loadable module, as a device driver, and/or in every and any other way known now or in the future to those of skill in the art of computer programming. Additionally, the present invention is in no way limited to implementation in any specific programming language, or for any specific operating system or environment.

Furthermore, it will be readily apparent to those of ordinary skill in the relevant art that where the present invention is implemented in whole or in part in software, the software components thereof can be stored on computer readable media as computer program products. Any form of computer readable medium can be used in this context, such as magnetic or optical storage media. Additionally, software portions of the present invention can be instantiated (for example as object code or executable images) within the memory of any programmable computing device.

Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

What is claimed is:

1. A method for automatically pausing advertisements based on user attention, the method comprising:  
 running, on an electronic device, a first application;  
 playing a digital video on a display device associated with the electronic device, in response to receiving, through the first application, a first user input to initiate the playing of the digital video;  
 playing an advertisement on the display device while the digital video is playing or paused, the playing of the digital video and the advertisement occurring in a first browser tab in a foreground part of a web browser;  
 pausing the advertisement automatically, in response to receiving a second user input through a second application during the playing of the advertisement, the second user input being preselected to cause the pausing of the advertisement;  
 capturing a picture of the paused advertisement;  
 controlling displaying, by the display device, the first browser tab in a background part of the web browser and a second browser tab in the foreground part of the web browser;  
 controlling displaying, by the display device, the picture of the paused advertisement on the second browser tab; and  
 resuming the playing of the advertisement in response to receiving, through the first application, a third user input, the third user input being preselected to cause the resuming of the playing of the advertisement.

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2. The method of claim 1, further comprising receiving over a computer network the advertisement from an ad server.

3. The method of claim 1, wherein the second user input includes a keystroke.

4. The method of claim 1, wherein the second user input includes a mouse movement.

5. The method of claim 1, wherein the first application is included on the first browser tab and the second application is included on the second browser tab.

6. The method of claim 1, wherein the displaying of the picture of the paused advertisement on the second browser tab includes displaying the picture over a part of a displayed webpage.

7. The method of claim 1, further comprising recording play times of the video and the advertisement.

8. A computer program product stored on a non-transitory computer-readable comprising:

instructions executable to play, through a first application loaded on an electronic device, a digital video on a display device associated with the electronic device, in response to receiving, through the first application, a first user input to initiate the playing of the digital video;

instructions executable to play, through the first application, an advertisement on the display device while the digital video is playing or paused, the playing of the digital video and the advertisement occurring in a first browser tab in a foreground part of a web browser;

instructions executable to pause the advertisement automatically, in response to receiving a second user input through a second application during the playing of the advertisement, the second user input being preselected to cause the pausing of the advertisement;

instructions executable to capture a picture of the paused advertisement;

instructions executable to control displaying the first browser tab in a background part of the web browser and a second browser tab in the foreground part of the web browser;

instructions executable to control displaying the picture of the paused advertisement on the second browser tab; and

instructions executable to resume the playing of the advertisement in response to receiving, through the first application, a third user input, the third user input being preselected to cause the resuming of the playing of the advertisement.

9. The computer program product of claim 8, further comprising instructions executable to receive the advertisement through a receiver of the electronic device from an ad server over a computer network.

10. The computer program product of claim 8, wherein the second user input includes a keystroke.

11. The computer program product of claim 8, wherein the second user input includes a mouse movement.

12. The computer program product of claim 8, wherein the first application is included on the first browser tab and the second application is included on the second browser tab.

13. The computer program product of claim 8, wherein the displaying of the picture of the paused advertisement on the second browser tab includes displaying the picture over a part of a displayed webpage.

14. The computer program product of claim 8, further comprising instructions executable to record play times of the video and the advertisement.

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**15.** A system for automatically pausing advertisements based on user attention, the system comprising:  
 an electronic device, including a display device and a web browser; the electronic device, configured to:  
 run the web browser;  
 play a digital video and an advertisement on the display device, in response to receiving, through a user interface of the first application, a first user input to initiate the playing of the digital video, and the playing of the digital video and the advertisement occurring in a first browser tab in a foreground part of a web browser;  
 pause the advertisement automatically, in response to receiving a second user input through a second application during the playing of the advertisement, the second user input being preselected to cause the pausing of the advertisement;  
 capture a picture of the paused advertisement;  
 control displaying the first browser tab in a background part of the web browser and a second browser tab in the foreground part of the web browser;  
 control displaying the picture of the paused advertisement on the second browser tab; and

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resume the playing of the advertisement in response to receiving, through the user interface of the first application, a third user input, the third user input being preselected to cause the resuming of the playing of the advertisement.

**16.** The system of claim **15**, further comprising: a system clock, coupled in communication with the electronic device, configured to provide play times of the playing of the digital video to a data log.

**17.** The system of claim **15**, wherein the electronic device is further configured to receive the advertisement from an ad server over a computer network.

**18.** The system of claim **15**, wherein the second user input includes a keystroke.

**19.** The system of claim **15**, wherein the second user input includes a mouse movement.

**20.** The system of claim **15**, wherein the first application is included on the first browser tab and the second application is included on the second browser tab.

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